



# Streamlines



Newsletter of the New Hampshire Volunteer River Assessment Program

June 2009

New Hampshire Department of Environmental Services Watershed Management Bureau

## Letter from the Commissioner



Water quality is a critical issue in New Hampshire and we are fortunate to have many high quality waters that draw numerous visitors to the Granite State each year. Protecting water quality in New Hampshire is essential to maintaining both a

healthy environment and a robust economy and tourism industry.

Since 1998, the New Hampshire Volunteer River Assessment Program (VRAP) has been promoting awareness of the importance of maintaining water quality in New Hampshire's rivers and streams, educating citizens about water quality and ecology, and improving water quality monitoring coverage. VRAP volunteers conduct water quality monitoring on an ongoing basis and increase the amount of river water quality information available to local, state and federal natural resources managers and advocates. Water quality measurements collected over time create a portrait of the fluctuating conditions in rivers and streams and help to determine where improvements, restoration, or preservation may be needed. The information provided by the VRAP program has allowed for more effective watershed management and more efficient use of financial resources.

Since its inception, VRAP has grown to serve 30 volunteer organizations and their approximate 200 participating volunteers. This volunteer effort provides critical data to NHDES for the assessment of our rivers and streams that, due to limited staff resources, the agency would not otherwise have. In New Hampshire's 2008 Section 305 (b) and 303 (d) Surface Water Quality Report to EPA, VRAP data contributed to the assessment of 1,432 miles of rivers and streams on 310 distinct waterbody segments. This represents approximately 15

percent of the assessed river and stream miles in New Hampshire.

In 2008 VRAP volunteers monitored 334 individual locations on our state's rivers and streams, and collected nearly 9,000 water quality samples. The 2008 assessment of New Hampshire's rivers and streams, as required by the federal Clean Water Act, included over 68,000 water quality standard comparisons, of which nearly 40 percent came from VRAP sampling efforts. VRAP data contributed to the assessment of 1,432 miles of rivers and streams on 310 riverine assessment units.

In addition to providing important water quality data, VRAP is invaluable in its ability to engage citizens in efforts to protect water quality and to serve as advocates for sound watershed management practices. On numerous occasions VRAP volunteers have reported water quality problems to NHDES that otherwise would likely have gone unnoticed. Using VRAP data to list rivers and streams on the Clean Water Act Section 303 (d) list of impaired waters, some VRAP watershed groups have also successfully acquired and used Clean Water Act Section 319 non-point source management grants to develop and implement tangible projects to restore water quality.

In closing, I want to thank you for your continued passion and dedication to preserving and for protecting New Hampshire's beautiful rivers and streams. We recognize that VRAP volunteers are invaluable to our department's mission of sustaining a high quality of life for all our state's citizens by protecting and restoring New Hampshire's environment. We look forward to a continued partnership in the years ahead.

Sincerely,

*Thomas S. Burack*

Commissioner

## 2008 Program Summary

In 2008, VRAP supported 26 volunteer groups and 198 volunteers, who monitored 334 stations on numerous rivers and watersheds throughout the state. These volunteers contributed approximately 1,609 hours of time solely collecting in-situ data. VRAP volunteers conduct water quality monitoring on an ongoing basis. Each year VRAP has continued to grow both in terms of the number of groups participating and the amount of useable data that is collected.

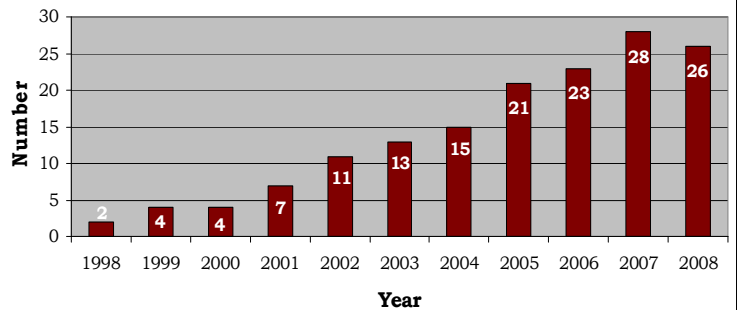
### 2008 QA/QC Summary

- VRAP volunteers collected **7,253** field parameters. Of these, **97 percent** were valid and usable for the 2010 NH Surface Water Quality Assessments.
- VRAP volunteers collected **1,392** laboratory samples. Of these, **99 percent** were valid and usable for the 2010 NH Surface Water Quality Assessments.
- The total number of samples (field parameters and laboratory samples) collected by VRAP volunteers was **8,645**. Of these, **97 percent** were valid and usable for the 2010 NH Surface Water Quality Assessments.
- A total of eight multiparameter datalogger deployments, accounting for **29,470** instantaneous data points were collected. Of these, **90 percent** were valid and usable for the 2010 NH Surface Water Quality Assessments.

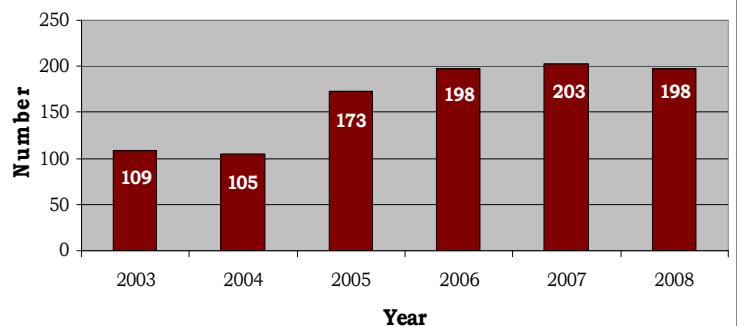
For more information visit

[http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/vrap2008qaqc\\_audit.pdf](http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/vrap2008qaqc_audit.pdf) to view the **2008 Programmatic Report & QA/QC Summary!**

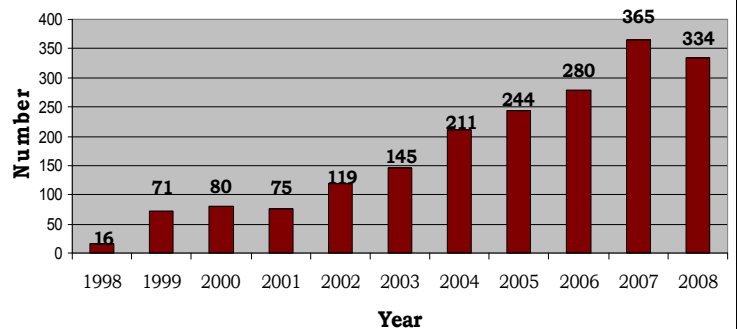
Number of VRAP Groups 1998-2008



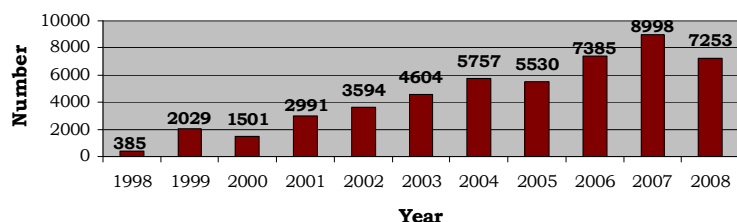
Number of VRAP Volunteers 2003 - 2008



Number of VRAP Stations Monitored 1998-2008



Number of VRAP Field Samples Measured  
(Excluding Replicates)  
1998-2008



## VRAP Honored with 2009 EPA Environmental Merit Award

The NHDES Volunteer River Assessment Program, Regional Greenhouse Gas Initiative Team, and Dave Chase (posthumous), radon program manager, were among recipients honored at Faneuil Hall in Boston in April as EPA presented its annual Environmental Merit Awards for 2009.

Given out by EPA since 1970, the Environmental Merit Awards honor individuals and groups who have shown particular ingenuity and commitment in their efforts to preserve the region's environment. The winners from New Hampshire were among 45 from across New England. Awards were given in the categories of individual; business (including professional organizations); local, state or federal government; and environmental, community, academia or nonprofit organization. Also, each year EPA

may present lifetime achievement awards for individuals.

VRAP staff would like to recognize all of the volunteer monitors, without

whom, VRAP would not have received this award. It is your diligence and dedication to water quality monitoring that enables VRAP to succeed. As VRAP celebrates its 10<sup>th</sup> anniversary, we are grateful to have such a longstanding and successful program. Thank you!



*Jen Drociak accepts the Environmental Merit Award from EPA Region 1 representatives on behalf of VRAP volunteers*

## 2008 VRAP Volunteer Participant Survey Distributed

In March, VRAP staff sent a 20-question survey to approximately 200 of its volunteers. Questions ranged from basic demographics, to volunteer participation, motivation, program effectiveness, communications, annual training workshops, field visits, and the annual water quality report.

The purpose of this survey was to recruit input as we work to develop a vision and strategy for the future of VRAP. It continues to be imperative that VRAP receive input from our volunteer monitors as they are the most knowledgeable about their local water resources. We are particularly interested in knowing how VRAP can most effectively assist our volunteers in their monitoring plans, how we can most effectively report water quality data, and what additional program development steps could be taken to improve VRAP.

*Streamlines* is published by



Thomas S. Burack  
Commissioner

Michael Walls  
Assistant Commissioner

Harry T. Stewart  
Water Division Director

Paul Currier  
Bureau Administrator  
Watershed Management

Ted Walsh  
VRAP Program Manager

Jen Drociak  
Editor and  
VRAP Coordinator

Watershed Management Bureau  
New Hampshire Volunteer River  
Assessment Program

29 Hazen Drive - PO Box 95  
Concord, NH 03302-0095  
(603) 271-0699

<http://des.nh.gov/organization/divisions/water/wmb/vrap/index.htm>

***“Boundaries don't protect rivers, people do.”***

— Brad Arrowsmith

Landowner along the Niobrara National Scenic River, Nebraska

## **A Conversation with the VRAP Coordinators, Past & Present**

Beth Malcolm coordinated VRAP from its inception in **1998** through 2002 when she joined the NHDES Wastewater Engineering Bureau State Revolving Fund (SFR). The Wastewater Engineering Bureau shares in the mission of protecting and preserving water resources by offering low interest loans and grants for water pollution control projects. The SFR is beginning to expand funding beyond traditional wastewater work to include stormwater treatment and other watershed protection efforts.

### **Q. *What were the some of the initial challenges in establishing VRAP?***

**A.** New Hampshire had the first state coordinator for volunteer river monitoring in New England. Establishing the program took several years, but public interest and the success and popularity of the Volunteer Lake Assessment Program eventually made it possible to initiate VRAP.

### **Q. *What were some of the ongoing challenges while coordinating VRAP?***

**A.** We were fortunate to receive a considerable equipment grant for VRAP through Senator Judd Gregg's office, which helped to provide the needed consistency in the collection of volunteer data. The sampling equipment made it possible to accommodate many river groups interested in providing reliable water quality data for rivers and streams that may never have been sampled before. The volunteers did the rest, carefully maintaining the equipment and sampling protocols and patiently awaiting the development of guidance materials and interpretation of water quality results.

### **Q. *As a volunteer coordinator, what kept you motivated?***

**A.** The enthusiasm of the volunteers and my love for natural resources. It has been an honor to be part of the exploration of so many wonderful watery places here in New Hampshire, all made possible by local initiative.

### **Q. *What were some of your fondest memories coordinating VRAP?***

**A.** I'd have to say the canoe trips! From the giant moss-laden snapping turtle emerging from the Cocheco River next to our canoe moments after I'd removed my arms from the water, to the green herons observing the portages we made traveling up into the headwaters of the Lamprey River, to the quiet hidden beauty of the Exeter River, the wonders of New Hampshire watersheds never cease to amaze and enchant me. All these places and so many more are worthy of the passionate efforts of the local river groups who taught me the best way to get to know a watershed is to get out in it!

In **2003**, Ted Walsh was hired to coordinate VRAP. Ted coordinated the program until November 2005, but continues to remain involved with VRAP, acting as Program Manager.

### **Q: *During the time that you were VRAP Coordinator, the number of participating groups and volunteers increased considerably. To what do you attribute this success in participation?***

**A.** All the credit for the increase in VRAP groups goes to the dedication of the volunteers and watershed groups who are working to protect their local rivers and streams. The dedication of our VRAP volunteers is extraordinary and they are the reason this program has been such a success.

### **Q: *How do you think VRAP has improved over the years?***

**A:** VRAP has improved in that many of our participating groups have taken the monitoring data they have collected and used it leverage resources for additional activities such as restoration activities, geomorphologic assessments, discharge monitoring and public outreach and education efforts.

**Q: *How do you think VRAP can continue to improve in the future?***

**A:** As long as the dedicated VRAP volunteers continue the excellent work they are doing we will continue to see increased public awareness of our invaluable aquatic resources, and a continued move towards more ecologically sound watershed management.

Jen Drociak was hired as VRAP Coordinator in November of **2005**.

**Q: *How do you think VRAP has improved over the years?***

**A:** It's funny; a colleague of mine recently found an informational article I wrote in 1998 on the inception of VRAP. For the past four years, I have had the honor and pleasure of coordinating the program and working with so many dedicated volunteers. I believe VRAP has grown tremendously over the past 10 years in both its capacity to partner with and foster additional new groups as well as its ability to provide increased technical assistance, especially in regards to special projects. I believe the annual training workshops are always becoming more efficient and effective, and that overall, standard operating procedures and informational publications are clearer, more concise, and better organized.

**Q: *How do you think VRAP can continue to improve in the future?***

**A:** VRAP is always striving to improve, and with any growth in capacity, there is always room for improvement. Ideally, it would be nice to be able to provide funding to each group, so that each group can monitor not only baseline ambient water quality parameters, but can monitor for nutrients and other analytes as well. This would provide for a better "snapshot" of river water quality. Along those lines, it would also be ideal to have several satellite laboratories in the state to alleviate inconvenience on the volunteers. Lastly, additional staff would allow additional field trainings and visits during the sampling season. Basically, it comes down to more money and more staff!

**Q: *What are some of the greatest skills you've learned while coordinating VRAP, and how have you applied them to other professional endeavors?***

**A:** Fortunately, I am always learning new skills in this job! Throughout my years as a volunteer coordinator in general, one of the most important things I have learned to appreciate and value are different learning styles. I have also learned additional organizational skills, interpersonal communication skills, volunteer retention and recognition, measuring volunteer program effectiveness, and enhancing the status of volunteer programs.

Learning skills in this field is a two way street. Volunteers teach me many things as well!

---

***"I choose to listen to the river for a while, thinking river thoughts, before joining the night and the stars."***

— Edward Abbey

## VRAP Interns: Where are they Now?

VRAP began hiring a seasonal intern during the summer of 2000. In 2001 and 2002, VRAP hired Sharon Pozner, and in 2004, VRAP hired Aric Tillberg. At the time of publication, we were unsuccessful at contacting either of them for updates, though we hope they are doing well and will let us know how they are doing!



- **2000: Jessana Palm:** After working for VRAP, Jessana earned a M.Sc. in conservation biology at Antioch New England Graduate School, where she completed her thesis research on Indiana Bat (*Myotis sodalis*) summer roost site habitat. In 2002, she began teaching biology part-time for NH Community College at the NH Technical Institute in Concord, where she is now a full-time associate professor in the department of chemistry and biology. Today she enjoys teaching a variety of natural science courses at NHTI, including ecology, plant biology, environmental science and field ornithology. During her time off, she keeps active with volunteer projects, hiking, biking, horseback riding, and playing with her dog Shamus.
- 

- **2003: April Arroyo:** Since July of 2005, April has been working for the city of Flagstaff, Ariz., Brownfields Land Recycling Program. In December 2006 she was promoted to brownfields specialist and still manages the program today. April is a self-proclaimed yoga addict and a chicken farmer. She says, "Living in the Southwest is a dream come true. I feel at home here."



- **2005/2006: Katie Zink:** After two seasons working for VRAP, Katie joined the Mass. Department of Environmental Protection Bacteria Source Tracking program in November of 2007. The goal of this program is to improve water quality in rivers, streams, ponds, lakes, estuaries, and coastal waters (including beaches) by finding and eliminating sources of bacterial pollution. Katie is still able to work with volunteer groups who have been essential in sharing data, showing her sampling locations, and locating problem areas.

Katie's work primarily focuses on identifying human sources of bacteria, such as direct connections between the sanitary sewer and storm drain systems, or areas where failing infrastructure has lead to exfiltrating sewers, and illicit home or business connections. Katie then works with the responsible party to enable them to schedule and implement the removal of pollutant sources.

---



■ **2007: Chelsea Martin:** With the experience Chelsea gained from the VRAP internship, she was able to secure a position with Vanesse Hanglin Brustlin, a land development, transportation and environmental consulting firm. Chelsea worked in Bedford for a year before transferring to North Ferrisburg. Most of her work is focused on wetland delineations and wetland mitigation. She currently lives in Burlington, where she enjoys skiing, running and anything near the lake.

■ **2008: Danielle (Adams) Mucciarone:** Since leaving VRAP in December 2008, Danielle has been working for the Charles River Watershed Association (CRWA). CRWA is a non-profit watershed protection group that formed in 1965 to “protect, preserve and enhance the Charles River and its watershed.” Danielle currently serves as CRWA’s 2009 Rita Barron Fellow. This one-year position is designed to give emerging watershed scientists a chance to gain hands on experience in the watershed field. During her time at CRWA, Danielle is creating a comprehensive database to manage the organization’s volunteer water quality monitoring data. She is also assisting with water quality monitoring, sub-watershed restoration projects, advocacy, grant-writing, permit research, website updates, environmental education, and GIS. On April 11, Danielle and her husband Jeff welcomed their first child, a son named Jaden into the world. Congratulations Danielle and Jeff!



## **2009: Welcome Sabrina Kliman!**

Sabrina began working for VRAP in June 2009 after graduating from Skidmore College in New York where she majored in chemistry and minored in environmental studies. She gained experience in water quality monitoring by working with Skidmore’s Water Resources Initiative in collaboration with the chemistry department. She enjoys kayaking, hiking, nordic skiing, and traveling. Sabrina grew up in northeastern Massachusetts and is excited to be back in New England after spending four years in New York, and is looking forward to getting to know New Hampshire better. She is excited to work with volunteers this summer on this project!

# EPA National Flowing Waters Survey

By: David Neils, NHDES Biomonitoring Program Coordinator

In 2008, EPA initiated a coordinated effort to characterize the condition of all flowing waters in the continental United States. In total, over 1,800 randomly selected sites were sampled in 2008 and 2009 for a comprehensive suite of biological, chemical, and physical parameters. As part of this effort, the NHDES biomonitoring program is coordinating sampling efforts for 16 sites within New Hampshire. In 2008, sampling was focused on large rivers and included seven stations on the Connecticut River, two stations on the Merrimack River, and one station on the Contoocook River. In 2009, the focus will shift to six stations on smaller rivers scattered around the state. At each station, field crews sample fish, macroinvertebrates, algae, bacteria, basic water chemistry parameters, nutrients, toxic metals, and habitat. Sampling at each station generally takes between 10 – 14 hours and includes a field crew of seven to eight staff.

The EPA, in conjunction with its state and tribal partners, plans to answer three primary questions with the data this is collected: what percent of the nation's rivers are in good, fair and poor condition; what are the key stressors that influence condition and their relative importance; and are there trends in condition

that can be detected since the 2004 national wadeable streams assessment? A final report is scheduled for release sometime in 2011.

In addition to participating in the national effort, the biomonitoring program will coordinate sampling at 34 randomly selected sites within New Hampshire in order to complete a statewide condition assessment of our rivers and streams. The field work associated with these sites will be completed in 2009 through 2010. A final report for this work should be available by 2012 and formal designated use assessments will be incorporated in the NHDES' 2012 305(b)/303(d) water quality report. A summary fact sheet will also be prepared for public consumption. This will represent the most complete, statistically valid effort to characterize the condition of our state's rivers and streams to date.

For more information regarding the national effort visit the EPA's Office of Water webpage at: <http://www.epa.gov/owow/riverssurvey/>

For more information regarding the statewide effort contact David Neils at (603) 271-8865 or [david.neils@des.nh.gov](mailto:david.neils@des.nh.gov).



Left: Gregg Dlubec with Northern Pike caught while electrofishing in the Connecticut River in Hinsdale

---

***“What makes a river so restful to people is that it doesn't have any doubt—it is sure to get where it is going, and it doesn't want to go anywhere else.”***

- Hal Boyle

# **The Road to River Designation:**

## ***The Experience of the Cocheco River and the Upper Reach of the Ammonoosuc River***

*By: Jennifer Rowden, NHDES Rivers Management Protection Program*

Since the establishment of the NH Rivers Management and Protection Program in 1988, 15 rivers have been accepted for protection because of their outstanding resources, values and characteristics. A river designation gives a river an extra level of state protection for significant instream river resources, particularly water quality and instream flows. The road to designation begins when a group of local citizens comes together to demonstrate the importance of a particular river to their community and the state. In 2007, the Cocheco River Watershed Coalition (CRWC) began the process of nominating the Cocheco River into the RMPP. In early 2008, the Ammonoosuc River Local Advisory Committee, as one of its first acts of business, sought to add the upper section of the Ammonoosuc River to the designated lower section which designated in August 2007.

In 1999, the CRWC began monitoring the water quality in the Cocheco River through the NH Volunteer River Assessment Program (VRAP). Participation in VRAP lead CRWC members to become aware of the RMPP and the benefits that designating the Cocheco River would have for coordinated river management and protection. In 2007, the CRWC worked with Strafford Regional Planning Commission to secure funds through the NH Coastal Program and NH Charitable Foundation to develop the nomination, which was submitted in May 2008. Once deemed complete by the NHDES Rivers Coordinator, a public hearing was held in Rochester where the public testimony was overwhelmingly supportive. The river nomination and public comments were then reviewed by the Rivers Management Advisory Committee, who recommended the river for designation based upon the strong public support for the nomination. Once the nomination was recommended for nomination by NHDES Commissioner Burack in September 2008, the bill language for inclusion of the Cocheco River into the RMPP was sent to the Legislature for approval. The Governor signed the bill into law making the Cocheco River the 16<sup>th</sup> designated river in the state.

*Streamlines, June 2009*



*Members of the Ammonoosuc River LAC partake in a site walk during the nomination process.*

Once a river is designated under the RMPP, a local river advisory management committee (LAC) is developed and is responsible for developing a local river corridor management plan and commenting on activities affecting the river that require state or federal permits. Each LAC is comprised of representatives from each riverfront municipality, which are nominated by the towns and appointed by the NHDES commissioner. LAC members represent a wide range of interests from local government to conservation to businesses. This diversity helps bring a variety of perspectives to bear on resource protection and development issues. LACs are the only NHDES appointed advisors and they serve as a unique local and state partnership for protecting a resource. The local development of a river corridor management plan and comments by the LAC on activities within the river corridor results in decisions reflecting the needs, values and concerns of local citizens. Since the RMPPs inception, the LACs have served as the driving force behind local protection efforts of each of the designated rivers.

The Ammonoosuc River is the most recent river to be designated in the summer of 2007. As one of their first orders of business, the newly appointed Ammonoosuc River LAC voted in January 2008 to begin the nomination process for including the

upstream portion of the river into the designation. The original Ammonoosuc River designation was the result of the town of Littleton obtaining funding in 2003 and cooperation with other towns and interested groups within the watershed in 2004 to participate in the Ammonoosuc River Corridor Assessment and Enhancement Project, a project designed to determine and address local concerns about the river on a corridor wide basis. Two of outcomes of this project were to seek designation for the Ammonoosuc River in the state program and to begin monitoring the river through VRAP. The nomination for the addition of the upstream portion to the Ammonoosuc River designation followed a similar same path as the Cocheco River. The bill awaits the Governor's signature, which should occur shortly.

Perhaps the most significant benefit of river designation is a collective statement by local residents and the state that a particular river is a unique and important resource deserving of protection. The state designation provides instream protection, the local plan addresses the management and protection of the shoreline and adjacent lands that make up the river corridor. Because the plan is locally developed, adopted and implemented, it reflects the specific needs, interests and concerns of local citizens. These plans are also often incorporated into watershed towns'

master plans. NHDES provides technical assistance to the LACs and other interested local and regional groups and officials on corridor management planning and other river related issues. Recently, RMPP staff aided the North Country Council in obtaining funding for development of the Ammonoosuc River Corridor Management Plan, part of which will include a fluvial geomorphic assessment used to identify areas of increase erosion and flooding hazards along the river corridor.

The RMPP has served and continues to serve as an effective means of giving local communities the ability to manage their rivers as valued resources and allows the state to be able to take local input into decisions regarding impact to New Hampshire's rivers. According to Lorie Chase, River Coordinator for CRWC, "As a citizen volunteer organization, the work of the Cocheco River Watershed Association has been greatly enhanced by our participation on both VRAP and RMPP. The programs bring proficiency, credibility and at times a lot of fun to our activities."

For more information please visit <http://des.nh.gov/organization/divisions/water/wmb/rivers/index.htm> or contact Steve Couture, Rivers Coordinator at (603) 271-8801 or [steven.couture@des.nh.gov](mailto:steven.couture@des.nh.gov).

---

## **Exeter River Geomorphic Assessment and Watershed-based Plan**

*By: Sally Soule, Coastal Watershed Restoration Coordinator*

The Exeter River Local Advisory Committee (ERLAC) is working with NHDES to develop a restoration and protection plan for four subwatersheds in the Exeter River basin. Results from the assessment will be used to develop a watershed restoration and protection plan. A geomorphic-based approach was selected because it provided a holistic watershed-scale approach to identifying stressors on river ecosystem health. The plan will provide local and regional recommendations for restoration and protection including land conservation, best management practices, regulatory approaches, riparian buffer protection and restoration, hazard mitigation, and outreach. Towns in the watershed will work together with ERLAC and NHDES to implement the recommendations.



*Exeter River, Cross Rd Bridge,  
Exeter*

# Cains Brook Watershed Restoration Project – Seabrook

By: Sue Foote, Seabrook Conservation Commission

Cains Brook is a freshwater stream that flows from its origin, a spring fed pond about one mile west of I-95 on the Salisbury, Mass./Seabrook, NH border. At its lower reaches the brook becomes Mill Creek, a tidal creek that discharges into the Hampton-Seabrook estuary. Along its course there are several ponds: Secords, Cains and Mary's Ponds to the west of Route 1, and Cains Mill Pond and Noyes Pond to the east. This stream system is approximately 3.8 miles long and has the distinction of being one of the very few streams in New Hampshire that has full flow of tidal influence with little obstruction or reduction in the tidal flow.

The Cains Brook Watershed has experienced significant residential and commercial growth over the past 20 years. These impacts have led to a degradation of the quality and aquatic habitat of the waters within the brook and the Hampton-Seabrook Estuary. Prior to this urbanization, there were significant and valuable terrestrial and aquatic habitats within the watershed. Seabrook has been concerned about the negative impacts of this recent development to the watershed's resources. A number of local and state initiatives have resulted in some progress toward restoring the quality of the watershed's water resources and habitats. These have included structural changes such as the reconstruction of the culvert and bridge over lower Cains Brook at the Spherex site and the dredging of Secord's Pond. These efforts have also included changes to the town's regulations to better manage stormwater from new development or redevelopment within the watershed.

In 2006 the Seabrook Conservation Commission adopted the original Cains Brook/Mill Creek Watershed Management Plan in effort to better manage the activities and resources within the watershed. The plan provided a "blueprint" for actions that were intended to achieve the vision for the watershed that provides for:

- Protecting land and water resources.
- Appropriately managing growth and development. a
- Ensuring opportunities for public use and recreation.

Since the adoption of the plan, the commission has established a watershed planning process in concert with the Department of Environmental Services consistent with EPA's nine criteria for watershed planning. This process has provided the opportunity for additional funding to help restore the natural resource and recreational values of the watershed, including the dredging of Cains and Cains Mill Pond.

## Water Quality Sampling in Cooperation with VRAP: 2007 and 2008

From May to September, volunteers collected monthly water samples at eight stations in the Cains Brook watershed. These stations were approximately in the same location as those sampled in 1997 in conjunction with the Cains Brook and Mill Creek Watershed Study. Unlike the 1997 study where there were numerous exceedances for *E.Coli*, there were none during the 2007 VRAP study.

## Earth Day +7 Cleanup along Rt. 1

As part of the 2007 NHDES/EPA 319 grant the Conservation Commission undertook an outreach and education



program for the reduction of trash and debris along the route corridor. This involved establishing a clean up action committee that included local businesses and interested

residents. This committee met several times and spoke with numerous businesses along Route 1 in an effort to establish a trash reduction action pilot program. The committee established a baseline monitoring study in the front of The Home Depot involving the collection and documenting of all trash. The intention was to establish a representative sample for trash reduction. Subsequent monitoring counts will be undertaken to determine if there has been any change in the level of trash collected. The committee also established a corridor clean-up day on April 29, 2008. Almost 2 tons of trash was removed from the watershed by over 120 dedicated volunteers. In the future this will be a biennial event.

### **Pet Waste**

In 2007 the Seabrook Conservation Commission was awarded a Pet Waste Control Grant to raise awareness about the potential pollution to waterways in Seabrook from pet waste, and how such waste can be controlled to prevent such pollution. Pet waste can be source of bacterial contamination which is a significant problem in New Hampshire's coastal waters. This project includes placing information on the town's website and the development and distribution of brochures to pet owners in Seabrook. The project also installed catch basin markers in neighborhoods along Cains Brook. The markers are a stainless steel disks embossed with "No dumping, drains to river" and a fish image.

### **Dredging and Stormwater Treatment of Cains Pond**

This project incorporates low impact dredge procedures to restore the ponds to historical depths and the installation of a stormwater

treatment structure on Rt. 1. This activity is being funded through an EPA 319 grant and is scheduled to begin in 2009. Such action would result in removal of approximately 7,500 cubic yards of accumulated sediment as well as reduced water temperatures and increased dissolved oxygen levels. The Conservation Commission has been approved for additional 319 funds to dredge Cains Mill Pond and replace the existing weir structure with a natural looking stone riffle slope (short rocky stream bed) to allow fish passage, but also maintain the Cains Pond water level to preserve aquatic habitat, recreational uses and scenic views. To prevent adverse impacts on aquatic pond life, this action will not be performed until Cains Pond dredging has been completed. A secondary benefit of this action is a reduction in Route 1 storm flooding and possible elimination of town dam ownership responsibilities. This project is scheduled to be combined with the dredging of Cains Pond in 2009 subject available funding.

At present, there is no treatment of the stormwater and consequently sediment-laden runoff discharges directly into the pond. The purpose of installing a water quality treatment unit in this location is to capture and treat stormwater runoff from Route 1 before it discharges into Cains Pond.

### **Looking Towards the Future**

Two additional ponds still need dredging and the Noyes Pond dam, which was severely damaged during the 2006 and 2007 floods, still needs rebuilding. In the fall of 2008 the owner of Noyes Pond, Stanley Hamel, signed a Conservation Easement for the pond and the adjacent wildflower field, plus transferred dam and water flow rights to the town of Seabrook. This agreement is crucial in making possible future restoration efforts.

---

***"Any river is really the summation of the whole valley.  
To think of it as nothing but water is to ignore the greater part."***

— Hal Borland, *This Hill, This Valley*

# Hodgson Brook: Improving Water Quality through Low Impact Development Techniques

By: Candace Dolan, Hodgson Brook Watershed Restoration Coordinator

“Shovels in the ground” is the new refrain of the Hodgson Brook Restoration project. Getting to the shovel-ready stage has not been a simple or quick task. It took three years of documenting baseline conditions and pinpointing problems before planning could even begin.

Hodgson Brook is a seven-mile long stream that flows through the heart of Portsmouth, New Hampshire to its receiving waters the North Mill Pond. Impervious surfaces cover 32 percent of the total watershed area. Stormwater flowing from these roads and roof tops into the brook has led to increased flows, high pollutant and sediment loads and its listing as impaired water.

Last summer the lower sub-watershed area, a mix of neighborhoods and businesses, was chosen for the first retrofit survey. A retrofit survey requires using maps, stormwater plans and field observations to determine how storm water actually moves through the system with the goal of identifying where it might be appropriate and feasible to retrofit the existing system to include additional treatment. Retrofits may include structural changes such as installing new storm drain inserts, or less costly smaller scale solutions like residential rain gardens and rain barrels. The final stage of the survey was to prioritize the implementation and to estimate how much each of these installations would reduce the “effective impervious coverage” in the project area.

Because myriad pollutants wash off impervious surfaces into Hodgson Brook it is not possible to isolate just one pollutant to target for reduction. The idea of using *effective impervious coverage* as a surrogate for pollutants is a new way of looking at the problem. Although it may not be possible to significantly reduce the *actual* impervious coverage in this watershed, it is possible to reduce the *effects* of it by finding ways to naturally filter and infiltrate the stormwater

back into the ground. It can be assumed that by reducing the amount of stormwater directly entering the brook without treatment the amount of pollutants have also been reduced.



*Volunteers help assess the biological integrity of the watershed by examining stream insects.*

Information gained during this first survey in the lower sub-watershed was used as the basis for the latest EPA funding grant application. Recently approved, this new funding along with a donation by the Port Motor Inn and with the assistance of the city of Portsmouth and the UNH Stormwater Center will be use to create a walkable stormwater treatment demonstration trail ,which will include a buffer restoration/snow dump bio-retention site, tree box filters on neighborhood streets, neighborhood and residential rain gardens and rain barrels.

This strategy, along with an accompanying education program, will be used in a multi-year phased approach in all the sub-watershed areas in the larger watershed, which over time will allow an impervious cover goal for the watershed to be set. By engaging neighborhood residents and businesses in reducing the amount of stormwater flowing into the brook from their properties through the use of retrofits the finished project this pilot project will demonstrate how the integration of these best management practices in a mixed-use neighborhood can reduce the amount of untreated stormwater entering the brook while enhancing properties and reducing homeowner dependency on city water for landscaping needs. VRAP volunteers will monitor water quality in Hodgson Brook to track water quality improvements over time as the retrofits are implemented.

# NHDES Completes Level 1 Landscape Assessment of New Hampshire's Wetlands

*By: Ted Walsh, Surface Water Monitoring Coordinator*

For many years, NHDES has had multiple successful water quality monitoring programs on our lakes, rivers, and estuaries. However, one of our state's most important water resources – wetlands – has not previously been a part of our monitoring and assessment programs. This past year, NHDES began the process of developing monitoring and assessment methods for wetlands. Using EPA guidance, DES has set out three levels of analysis to develop these methods.

- **Level 1- Landscape Assessment:** A GIS-based assessment of landscape development indices used to characterize the buffers that surround wetlands.
- **Level 2 – Rapid Wetland Assessment:** An evaluation of the general condition of individual wetlands using relatively simple field indicators.
- **Level 3- Intensive Site Assessment:** A detailed assessment of biological integrity and hydrogeomorphic function.

In the fall of 2008, NHDES completed a Level 1 landscape assessment of almost 24,000 distinct wetland assessment units. Through use of a GIS model, a 125m buffer was first created around each wetland assessment unit. These buffers were then evaluated based on land cover types and their corresponding impact on the ecologic communities that reside within the wetland proper.

The Level 1 landscape assessment is based upon the aquatic life designated use and is intended to identify those wetlands that are likely or unlikely to provide suitable conditions for supporting a balanced, integrated and adaptive community of aquatic flora and fauna. The assessment was based on the idea that the condition of a wetland's buffer will be a major driver of the condition of the wetland. Further, we can systematically estimate the condition of the buffer by knowledge of the land cover types within that buffer. Due to the inherent roughness of a



landscape level analysis and that no in-wetland measurements were conducted, no definitive support categories were made. Based upon the results of the analysis the use support category “potentially supporting” or “potentially not supporting” will be assigned to each assessment unit.

The 2006 National Land Cover Data (NLCD) was used to identify landscape types within each wetland buffer area. For example, a wetland assessment unit in a rural area might have a buffer comprised of 60 percent deciduous forest, 30 percent coniferous forest, and 5 percent pasture. In comparison, a wetland assessment unit in an urban area might have a buffer comprised of 40 percent medium density development, 40 percent high intensity development, and 10 percent deciduous forest. For each of the landscape types we then calculated pollutant loads for some of the more common pollutants likely to negatively impact the ecological health of a wetland such as total phosphorus, total nitrogen, metals, etc. Once the pollutant loads were determined for each of the landscape types, we were able to convert those ecological impacts to a “score.” A total score was

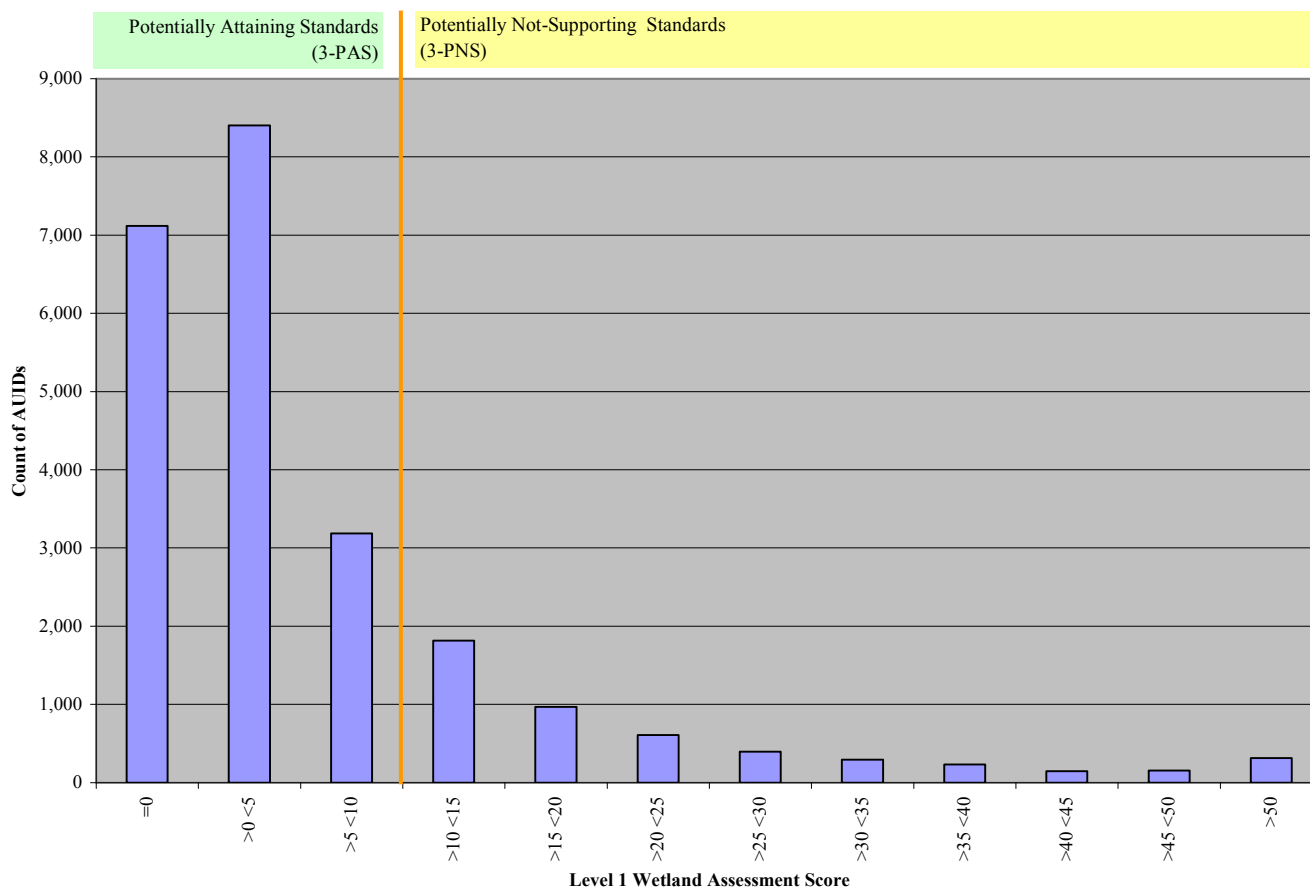
calculated for each wetland assessment unit by multiplying the percent of the total area in each landscape type within the buffer by the individual assessment score for each land cover class.

In order to identify wetland assessment units as “potentially supporting” or “potentially not supporting” for the aquatic life designed use, a threshold was needed for the Level 1 assessment scores. Both the Center for Watershed Protection and NHDES have determined that once a watershed area exceeds 10 percent impervious surface cover, exceedences of water quality criteria are likely. Thus, if a wetland buffer is comprised of 10 percent or greater of the “high density developed” NLCD landscape type, that wetland assessment unit is very likely to have violation of water quality standards. Based upon the 10 percent threshold, any wetland assessment unit with a Level 1 score exceeding 10 will be listed as potentially not supporting.

Figure 1 shows the distribution of the resulting scores from the Level 1 assessment. A total of 18,909 (80.0%) wetland assessment units were assessed as potentially supporting and 4,717 (20.0%) as potentially not supporting. Results of the Level 1 assessment including both the Level 1 Assessment Score and the relationship to the potential support threshold, were included in the 2008 305(b) report to EPA.

NHDES is in the beginning stages of developing a Level 2 rapid wetland assessment method (RAM) to evaluate wetlands. It is our goal to develop a RAM that could be used by the hundreds of VLAP and VRAP volunteers NHDES is so fortunate to work with. Incorporating wetland assessments into VLAP and VRAP monitoring will provide volunteers, watershed groups, and lake associations with a powerful tool to better understand the overall health of their watersheds of interest.

**Figure 1: Distribution of Level 1 Wetland Assessment Score**



# New Hampshire Watershed Report Cards

## Built from the 2008 305(b)/303(d) Surface Water Quality Reports

By: Ken Edwardson, Surface Water Quality Assessment Program Coordinator

### 305(b)/303(d) Integrated Report Background

<http://des.nh.gov/organization/divisions/water/wmb/swqa/>

The Surface Water Quality Assessment Program produces two surface water quality documents every two years: the "305(b) Report" and the "303(d) List." As the two documents use the same data and assessment methodology, the 305(b) Report and 303(d) List were combined into one Integrated Report. The Integrated Report describes the quality of New Hampshire's surface waters and an analysis of the extent to which all such waters provide for the protection and propagation of a balanced population of shellfish, fish, and wildlife, and allow recreational activities in and on the water.

Each Watershed Report Card covers a single 12-digit Hydrologic Unit Code (HUC12), on average a 34 square mile area. Each Watershed Report Card has three components:

1. **Report Card:** A one-page card that summarizes the overall use support for Aquatic Life, Primary Contact (e.g., Swimming), and Secondary Contact (e.g., Boating) Designated Uses on every Assessment Unit ID (AUID) within the HUC12.
2. **HUC 12 Map:** A map of the watershed with abbreviated labels for each AUID within the HUC12.
3. **Assessment Details:** Anywhere from one to 40 pages with the detailed assessment information for each and every AUID in the Report Card and Map.

### How to Find Your HUC12 Watershed Report Card

First go

to [http://des.nh.gov/organization/divisions/water/wmb/swqa/report\\_cards.htm](http://des.nh.gov/organization/divisions/water/wmb/swqa/report_cards.htm)

then go to: <http://www2.des.nh.gov/SWQA>

Then the  
HUC12  
of interest.

#### TIP!

It may take a try or two  
to get the right area.

Town/City:

HUC 12	Name
010700010601	COCKERMOUTH RIVER
010700010602	HORNET COVE
010700010603	SANBORN BAY TO NEWFOUND R.
010700010701	SMITH RIVER UPPER
010700010702	SMITH RIVER LOWER

#### TIP!

Turn off  
Pop-up  
Blockers to  
see the  
Report Card.

**TO  
FIND  
YOUR  
HUC12...**

On the web,  
select  
your town  
of interest.

Town/City:

- ACWORTH
- ALBANY
- ALEXANDRIA**
- ALLENSTOWN
- ALSTEAD

## What are Assessment Units?

Each waterbody is divided into smaller segments called assessment units (AUs). In general, AUs are the basic unit of record for conducting and reporting the results of all water quality assessments. AUs are intended to be representative of homogenous segments; consequently, sampling stations within an AU can be assumed to be representative of the segment. Many factors can influence the homogeneity of a segment. Factors used to establish homogenous AUs for assessments include: waterbody type, HUC12 boundaries, water quality standards, pollutant sources, maximum AU size for rivers and streams, major changes in land use, stream order/location of major tributaries, public water supplies, outstanding resource waters, shellfish program categories, designated beaches, and cold water fish spawning areas.

**Assessment Unit IDs (AUIDs)** for each of the stations your group monitored in 2008 can be found in the sampling station table in the 2008 VRAP report. Similarly, a list of all current and historic sampling stations for your group can be found on the VRAP webpage at <http://des.nh.gov/organization/divisions/water/wmb/vrap/index.htm>.

## How are the Surface Water Quality Assessment Determinations Made?

All readily available data with reliable quality assurance/quality control is used in the biennial surface water quality assessments. For a full understanding of how the Surface Water Quality Standards (Env-Wq 1700) are translated into surface water quality assessments we urge the reader to review the 2008 Consolidated Assessment and Listing Methodology (CALM) at <http://des.nh.gov/organization/divisions/water/wmb/swqa/2008/index.htm> (Appendices 4 & 5)

## Where Can I find More Advanced Resources?

Additional resources including GIS shapefiles (Appendix 12) of all AUIDs in a sortable EXCEL file (Appendix 22) of the detailed assessments are available at <http://des.nh.gov/organization/divisions/water/wmb/swqa/2008/index.htm>.

## How Are Assessments Coded in the Report Card?

Assessment outcomes are displayed on a color scale as well as an alpha numeric scale that provides additional distinctions for the designated use and parameter level assessments as outlined in the table below.

		Severe	Poor	Likely Bad	No Data	Likely Good	Marginal	Good
		Not Supporting, Severe	Not Supporting, Marginal	Insufficient Information – Potentially Not Supporting	No Data	Insufficient Information – Potentially Full Supporting	Full Support, Marginal	Full Support, Good
Category	Description							
*Category 2	Meets standards						2-M or 2-OBS	2-G
Category 3	Insufficient Information			3-PNS	3-ND	3-PAS		
Category 4	Does not Meet Standards;							
4A	TMDL^ Completed	4A-P	4A-M or 4A-T					
4B	Other enforceable measure will correct the issue.	4B-P	4B-M or 4B-T					
4C	Non-pollutant (i.e. exotic weeds)	4C-P	4C-M					
Category 5	TMDL^ Needed	5-P	5-M or 5-T					
* "Category 1" only exists at the Assessment Unit Level. ^ TMDL stands for Total Maximum Daily Load studies ( <a href="http://des.nh.gov/organization/divisions/water/wmb/tmdl/index.htm">http://des.nh.gov/organization/divisions/water/wmb/tmdl/index.htm</a> )								

## VRAP Is Now Tweeting On Twitter!

VRAP will now be using the website Twitter in an effort to provide more information to our VRAP volunteers and other citizens in issues involving New Hampshire's rivers and stream. We will be collaborating with the Rivers Management Protection Program as part of this effort and thus will provide information relevant to both programs.

Twitter is a free service. This information will not replace our traditional use of email and the VRAP webpage for communicating important program information. This is an effort to provide additional information and resource to those who are interested without having to send out emails or require the need to download documents. Twitter is designed to work with dialup internet access as well as high speed connections.

Our hope is that this will be used for two-way communication between VRAP

staff and our volunteers, and others who want river-related news. We encourage you to take a look at our Twitter page and sign up for all the VRAP and RMPP updates. Please share any information you feel would be helpful to those involved in VRAP and working on behalf of New Hampshire's rivers and streams.

To visit our page on Twitter just go to [http://twitter.com/NHDES\\_rivers](http://twitter.com/NHDES_rivers). When searching for VRAP, make sure you use the underscore in between the words NHDES and rivers. Or, use the "Find People" tool and type NHDES\_Rivers.



---

## Have You Scheduled An Annual Field Visit Yet?

VRAP staff aim to visit each group annually during a scheduled sampling event to verify that volunteers successfully follow the VRAP protocols. If necessary, volunteers are re-trained during the visit, and the group is notified of the result of the verification visit.

During the field sampling procedures assessment, VRAP staff offer important reminders and suggestions to ensure proper sampling techniques and re-train volunteers in the areas needing improvement. Afterwards, the volunteers are sent a follow-up e-mail providing written reminders and suggestions of the methods that need improvement. It is important to ensure that all volunteers attend

an annual VRAP training workshop prior to the sampling season and to familiarize themselves with proper sampling techniques, written protocols, and the use of water quality meters.

Please remember to schedule an annual volunteer field sampling procedures assessment in 2009 by contacting the VRAP Coordinator at (603) 271-0699.



---

***"There's a river somewhere that flows through the lives of everyone."***

— Roberta Flack



## Thank You All 2008 VRAP Volunteers!



*Cold River Local Advisory Committee VRAP volunteers Deb Hinman and Jen Polcari collect a water sample.*

Ellie Murray, Emily Cira, Emily Poworoznek, Eric Fiegenbaum, Erin Rooney, Evan Karpf, Evan Leonard, Evan Poworoznek, Felicia Hatch, Forrest Benoit, Fred Gunter, Gary Newfield, George Emblay, Gloria Quigley, Helen Clement, Jack Mettee, Jacy Heidorn, James Gardener, Jana Stoupas, Janet Towse, Jasmine Schonwald, Jean Meegan, Jeanne Leone, Jeff Conrad, Jeff Volkers, Jeff Winders, Jen Barton, Jen Polcari, Jill Winton, Jim Holley, Jim Hornbeck, Jim Irish, Jim McGranaghan, Joan Karpf, Joe Marshall, Joey Heidorn, John Johnstone, John Ludgate, John Paquette, Jonas Insinga, Joy Sykes, Joyce Heidorn, Judy Ludgate, Judy Preston, Justin Preisendorfer, Karen Debonis, Kathleen Doyle, Kathy Finch, Katie Fiegenbaum, Keith Hopkins, Kendra Bumpus, Kevin Constantine, Kyle Hoffman, Larry Cushman, Larry O'Connelly, Laura Deming, Laura Weit, Lenore Clark, Lenore Clark, Leslie Bergum, Leslie



*Sucker Brook VRAP volunteer Brian Sullivan calibrates for dissolved oxygen.*

Adam Black, Adele Fiorillo, Andrew Middleton, Andy Zevetchin, Ann Sweet, Anthony Simone, Aron Insinga, Audrey Eisenhauer, Barbara Flynn, Barbara Haglind, Barbara Skuly, Bea Jillette, Ben Getchell, Beth Ball, Beth Chestnutt, Bethann McCarthy, Betsy Chadwick, Bill Fischang, Bob Ball, Bob Morin, Brad Hutchinson, Brian Gallagher, Brian Sullivan, Bruce Adami, Bruce Kirmmse, Cal Schroeder, Candace Dolan, Carl Starr, Carolyn MacDonald, Catherine Gardener, Celia Abrams, Charles Muller, Charlie Beck, Charlie Montgomery, Charlie Ryan, Cheryl Smith, Chuck Martindill, Cindy Martindill, Cindy Romano, Clayton Carl, Connie McDade, Cornelia Courtney, Cyndi Twombly, Cynthia Hajjar, Dale Bogaski, Dan Newton, Dan Paradis, Darryl Mazzaglia, Dean Anson, Deb Hinman, Deb Kimball, Deb Stevens, Denise Rico, Devin Vandalinda, Dick Dodge, Dick Flanders, Don Clement, Don Twombly, Donna Dills, Doris Korst, Duncan Mellor, Ed Craxton, Ed Kelly, Ed Tomashek, Ellen Fisher,



*Hodgson Brook VRAP volunteer Erin Rooney measures pH.*

Williams, Linda Fuerderer, Lisa Loosigian, Liz Fletcher, Lorie Chase, Malcom MacDonald, Marian Baker, Marilyn Johnson, Mark Henderson, Maryalice Fischer, Mauro Parada, Max Stamp, Melissa Oullette, Merle Insinga, Mike Heidorn, Mike Kappler, Mike Morrison, Mike Suprin, Nancy Oleson, Nancy Zink-Mailloux, Pat Osment, Pat Tarpey, Patrick Eggleston, Patty Evans, Paul Pepler, Peg Boyles, Peg Fischang, Penny Eggleston, Pete Richardson, Peter Keefe, Peter Landry, Peter Stoupas, Phil Harvey, Ray Littlefield, Ric Erickson, Rich Rosencrans, Richard Walling, Robert Bradbury, Robert Cote, Robert Lamoy, Robert Thompson, Rod Cyr, Roger Sweet, Ron Rogstad, Roxanna Chomas, Sam Demeritt, Sandy Sonnichsen, Sara Hatch, Scott Pim, Selinda Chiquine, Sigrid Scholz, Steve Couture, Steve Stepenuck, Steve Wagner, Steven Fellows, Sue Foote, Sue Lichty, Susan Mooney, Teagen Mellor, Ted Hillson, Terry Hickman, Terry McMillan, Thomas Fargo, Tim Dinsmore, Tom Anderson, Tom Lee, Vickie Branch, Vincent Lunetta, Virginia Schonwald, Wayne Donle, Will Harrison, Winnie Ward, Youth Conservation Corps.